Effects of mesenchymal stem cell therapy, in association with pharmacologically active microcarriers releasing VEGF, in an ischaemic stroke model in the rat

Titre	Effects of mesenchymal stem cell therapy, in association with pharmacologically active microcarriers releasing VEGF, in an ischaemic stroke model in the rat
Type de publication	Article de revue
Auteur	Quittet, Marie-Sophie [1], Touzani, Omar [2], Sindji, Laurence [3], Cayon, Jérôme [4], Fillesoye, Fabien [5], Toutain, Jérôme [6], Divoux, Didier [7], Marteau, Léna [8], Lecocq, Myriam [9], Roussel, Simon [10], Montero-Menei, Claudia [11], Bernaudin, Myriam [12]
Pays	Etats-Unis
Editeur	Elsevier
Ville	New York
Type	Article scientifique dans une revue à comité de lecture
Année	2015
Langue	Anglais
Date	2015 Mar
Pagination	77-88
Volume	15
Titre de la revue	Acta Biomaterialia
ISSN	1742-7061
Mots-clés	Angiogenesis [13], Mesenchymal Stem Cells [14], Pharmacologically active microcarriers [15], Stroke [16], VEGF [17]
Résumé en anglais	Few effective therapeutic interventions are available to limit brain damage and functional deficits after ischaemic stroke. Within this context, mesenchymal stem cell (MSC) therapy carries minimal risks while remaining efficacious through the secretion of trophic, protective, neurogenic and angiogenic factors. The limited survival rate of MSCs restricts their beneficial effects. The usefulness of a three-dimensional support, such as a pharmacologically active microcarrier (PAM), on the survival of MSCs during hypoxia has been shown in vitro, especially when the PAMs were loaded with vascular endothelial growth factor (VEGF). In the present study, the effect of MSCs attached to laminin-PAMs (LM-PAMs), releasing VEGF or not, was evaluated in vivo in a model of transient stroke. The parameters assessed were infarct volume, functional recovery and endogenous cellular reactions. LM-PAMs induced the expression of neuronal markers by MSCs both in vitro and in vivo. Moreover, the prolonged release of VEGF increased angiogenesis around the site of implantation of the LM-PAMs and facilitated the migration of immature neurons towards the ischaemic tissue. Nonetheless, MSCs/LM-PAMs-VEGF failed to improve sensorimotor functions. The use of LM-PAMs to convey MSCs and to deliver growth factors could be an effective strategy to repair the brain damage caused by a stroke.

URL de la notice	http://okina.univ-angers.fr/publications/ua13179 [18]
DOI	10.1016/j.actbio.2014.12.017 [19]
Autre titre	Acta Biomater
Identifiant (ID) PubMed	25556361 [20]

Liens
[1] http://okina.univ-angers.fr/publications?f[author]=23158
[2] http://okina.univ-angers.fr/publications?f[author]=23159
[3] http://okina.univ-angers.fr/l.sindji/publications
[4] http://okina.univ-angers.fr/jerome.cayon/publications
[5] http://okina.univ-angers.fr/publications?f[author]=23161
[6] http://okina.univ-angers.fr/publications?f[author]=23162
[7] http://okina.univ-angers.fr/publications?f[author]=23163
[8] http://okina.univ-angers.fr/publications?f[author]=23164
[9] http://okina.univ-angers.fr/publications?f[author]=23165
[10] http://okina.univ-angers.fr/publications?f[author]=23166
[11] http://okina.univ-angers.fr/c.menei/publications
[12] http://okina.univ-angers.fr/publications?f[author]=23167
[13] http://okina.univ-angers.fr/publications?f[keyword]=90
[14] http://okina.univ-angers.fr/publications?f[keyword]=7989
[15] http://okina.univ-angers.fr/publications?f[keyword]=8395
[16] http://okina.univ-angers.fr/publications?f[keyword]=1606
[17] http://okina.univ-angers.fr/publications?f[keyword]=19132
[18] http://okina.univ-angers.fr/publications/ua13179
[19] http://dx.doi.org/10.1016/j.actbio.2014.12.017
[20] http://www.ncbi.nlm.nih.gov/pubmed/25556361?dopt=Abstract